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Session: General Circulation Model Downscaling for Impact, Vulnerability and
Adaptation Assessments: Methodologies and Applications

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Title

Evaluating downscaling methods for seasonal climate forecasts over East Africa

Abstract

The U.S. National Multi-Model Ensemble seasonal forecasting system is providing hindcast and real-time data streams to be used in assessing and improving seasonal predictive capacity. The NASA / USAID SERVIR project, which leverages satellite and modeling-based resources for environmental decision making in developing nations, is focusing on the evaluation of NMME forecasts specifically for use in impact modeling within hub regions including East Africa, the Hindu Kush-Himalayan (HKH) region and Mesoamerica. One of the participating models in NMME is the NASA Goddard Earth Observing System (GEOS5). This work will present an intercomparison of downscaling methods using the GEOS5 seasonal forecasts of temperature and precipitation over East Africa.

The current seasonal forecasting system provides monthly averaged forecast anomalies. These anomalies must be spatially downscaled and temporally disaggregated for use in application modeling (e.g. hydrology, agriculture). There are several available downscaling methodologies that can be implemented to accomplish this goal. Selected methods include both a non-homogenous hidden Markov model and an analogue based approach. A particular emphasis will be placed on quantifying the ability of different methods to capture the intermittency of precipitation within both the short and long rain seasons. Further, the ability to capture spatial covariances will be assessed. Both probabilistic and deterministic skill measures will be evaluated over the hindcast period.